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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/700,098

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Aoi Tanaka

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EXAMINER

HODGE, ROBERT W

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

01/29/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/700,098	Applicant(s) TANAKA ET AL.	
	Examiner ROBERT HODGE	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10-13, 16 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-13, 16 and 19-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see the Translation of the instant Foreign Priority Document and Remarks, filed 11/12/08, with respect to the rejection(s) of claim(s) 1-7, 10-13, 16, 19 and 20 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. 3,351,494.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-7, 10-13, 16, 19, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,746,793 hereinafter Gyoten et al. in view of U.S. Patent No. 3,351,494 hereinafter Batzold as evidence by Advanced Organic Chemistry: Reactions, Mechanisms, and Structure by Jerry March hereinafter March.

Regarding claims 1, 20 and 21, as disclosed in Example 14, Gyoten et al. teach a production method of making a catalyst layer in fuel cells having two electrodes comprising a substrate material such as carbon particles that are made water repellent by chemically bonding an ion-conducting functional group to a surface of the carbon particles through a hydrochloric acid elimination reaction (i.e. dehydrochlorination), the bonded groups include but are not limited to carboxyl groups and silane groups, the

Art Unit: 1795

bonded water repellent particles are then mixed with catalyst particles to form a catalyst layer, see also examples 9 and 12.

Gyoten et al. do not teach the substrate particles to be inorganic particles or specifically disclose that the actual bond formed by the elimination reaction is a covalent bond.

Batzold teaches a method of making a catalyst layer in fuel cells by wetproofing substrate particles such as carbon, mica and alumina by exposing the substrate particles to a halogenated alkyl silane (column 2, lines 6 et seq.).

Gyoten et al. discloses the claimed invention except for the substrate particles are inorganic particles instead of carbon particles. Batzold shows that substrate particles for a catalyst layer such as carbon, mica and alumina are equivalent structures known in the art. Therefore, because these structures were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute mica and alumina for carbon in Gyoten et al. as taught by Batzold. Simple substitution of one known element (Batzold's mica and alumina substrate particles) for another (Gyoten's carbon particles) would achieve the predictable result of providing a catalyst layer having substantial structure and high efficiency (Batzold column 2, lines 12-13). See MPEP 2141 (III) Rationale B, KSR v. Teleflex (Supreme Court 2007).

On page 727, March discloses that elimination reactions such as dehydrochlorination reactions result in covalent bonds and therefore as evidence by March the result of Gyoten's elimination reaction will inherently be a covalent bond.

A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 2, Gyoten et al. disclose the mean molecular weight of silane compound is 40-10,000. See Column 19, Lines 10-55.

With respect to claim 3, Gyoten et al. disclose the silane compound has a functional group capable of dissociating a hydrogen ion at the end and has at least one of a hydrocarbon chain and a fluorocarbon chain. See Column 15, Lines 46-50.

With respect to claims 4-6, Gyoten disclose a hydrolysable group that converts into an activated silanol group and reacts with an oxide on the surface, which permits formation of a solid bond (i.e. covalent bond). The silane compound has a hydrogen ion dissociating functional group such as sulfonic group or carboxyl group. See Column 16, Lines 6-14.

With respect to claim 7, Gyoten et al. disclose that by making this silane compound having a basic functional group containing a nitrogen atom having a lone pair at the end, for example, an amid group or an amine group, mutual reaction with a polymer electrolyte having a residual group of an acid such as sulfonic acid can be caused. See Column 17, Lines 44-49.

With respect to claim 10, Gyoten et al. disclose conducting HCl elimination reaction with $-\text{SiCl}_3$ group, $-\text{OH}$ group or other function group or oxide, a monomolecular adsorption film is formed with a silane compound on the surface of the

Art Unit: 1795

catalyst or on the surface of the carbon carrier. See Column 18, Line 63 to Column 19, Line 1.

With respect to claim 11, Gyoten et al. disclose the use of platinum particle as the catalyst. See Column 18, Lines 55-56.

With respect to claims 12, 13 and 16, Gyoten et al. disclose the use of carbon powder in the catalyst layer that is an electron conductor. The carbon powder has an average diameter of 2 to 10 microns. See Column 9, Lines 22-23.

With respect to claim 19, Gyoten et al. disclose the catalyst having a thickness of 30-100 microns. See Column 1, Lines 43-44.

The examiner notes that claim 20 is a product-by-process claim. "Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps". See MPEP § 2113.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT HODGE whose telephone number is (571)272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert Hodge/
Examiner, Art Unit 1795